

ARCADIS Varic/Orbic

SP

Installation Instructions

System

Multi-function switch

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General information

Validity of the document

This document is valid for the subsequent installation of a multi-function footswitch in an ARCADIS Varic system or an ARCADIS Orbic system that has been prepared for the multi-function footswitch option.

Requirements

The ARCADIS Varic and ARCADIS Orbic systems delivered after December, 2006 (approximately) have already been prepared for the installation of the multi-function footswitch. The following are indications that a system has been prepared for this installation:

- ⇒ There is an externally accessible footswitch plug connector socket on the basic unit.
- ⇒ The holes for attaching the footswitch holder to the cover panel have already been drilled and are fitted with dummy covers.
- ⇒ The internal wiring for the footswitch plug connection has been prepared for the upgrade to the multi-function footswitch.
- ⇒ Software version VB13C or higher is installed on the system.

NOTE

It is not possible to upgrade ARCADIS Varic or ARCADIS Orbic systems with the multi-function footswitch option upgrade kit unless these preparations have been made.

Required material

- Multi-function footswitch option, material number 08079548

Tools and auxiliary equipment required

- Standard tool kit
- Cable ties (included in the delivery volume of the multi-function footswitch)

Safety information

General safety information



Danger of injuries, death or material damage.

Non-compliance can lead to death, injury or material damage.

Please note:

- ⇒ The product-specific safety notes in these instructions,
- ⇒ The general safety information in TD00-000.860.01... and
- ⇒ The safety information in accordance with ARTD Part 2.

General electrical safety information



Electrical safety!

Non-compliance can lead to severe injury or even death, as well as material damage.

- ⇒ Parts under electrical voltage are accessible when the covers are open. To avoid danger, disconnect the system from the power supply before opening the covers. Disconnect the power plug.
- ⇒ If an uninterruptible power supply (UPS) is installed in the system, the voltage output of the UPS must also be deenergized or the voltage output plug must be disconnected.
- ⇒ If work steps must be performed using electrical power, the general safety information according to TD00-000.860.01 must be observed.

Radiation safety information



X-ray radiation!

Non-compliance can lead to illness, irreversible damage to body cells and the genotype, severe injury and even death.

During work on the system in which radiation must be released, the radiation protection directives and the rules for radiation protection according to ARTD-002.731.02.. must be complied with.

Please note:

- ⇒ Use available radiation protection devices.
- ⇒ Wear radiation protection clothing (lead apron).
- ⇒ Stay as far away as possible from the radiation source.
- ⇒ Release radiation only if necessary.
- ⇒ Set the radiation activity as low as possible. (low kV and mA values, short radiation time)
- ⇒ Release radiation for as short a time as possible.
- ⇒ Checks requiring the release of radiation are identified by the radiation warning symbol shown on the left.



Information on the protective conductor resistance test

Observe the instructions in the "Safety Rules for Installation and Repair" (ARTD-002.731.17 ...).

The protective conductor resistance must be measured after every intervention in the system.

However, documentation of the measured values is required only during periodic safety checks.

If parts/components that can significantly influence the protective conductor resistance (e.g., replacement of the power cable, replacement of the power-up module, replacement of multi-pole connection cables which also create the protective conductor connection between system parts (e.g., monitor cable or C-arm cable)) are replaced or if protective conductor connections have been repaired, the protective conductor resistance must be measured. The values must be documented and evaluated in the protective conductor resistance protocol.

NOTE

For evaluation purposes, the first measured value and the values documented during maintenance or safety checks must be compared to the measured values. A sudden or unexpected increase in the measured values may indicate a defect in the protective conductor connections - even if the limit value of 0.2 ohms is not exceeded. (Protective conductor or contacts).

The measurement must be performed according to DIN VDE 0751, Part 1 (see ARTD Part 2). The protective conductor resistance for all touchable conductive parts must be measured during the normal operating state of the system.

Make sure that control cables or data cables between the components of the system are not mistaken for protective conductor connections.

During the measurement, the power cable and additional connection cables which also create the protective conductor connection between system parts (e.g. monitor cable between the basic unit and monitor trolley) must be moved section by section to detect cable breaks.

The protective conductor resistance must not exceed 0.2 Ohms.

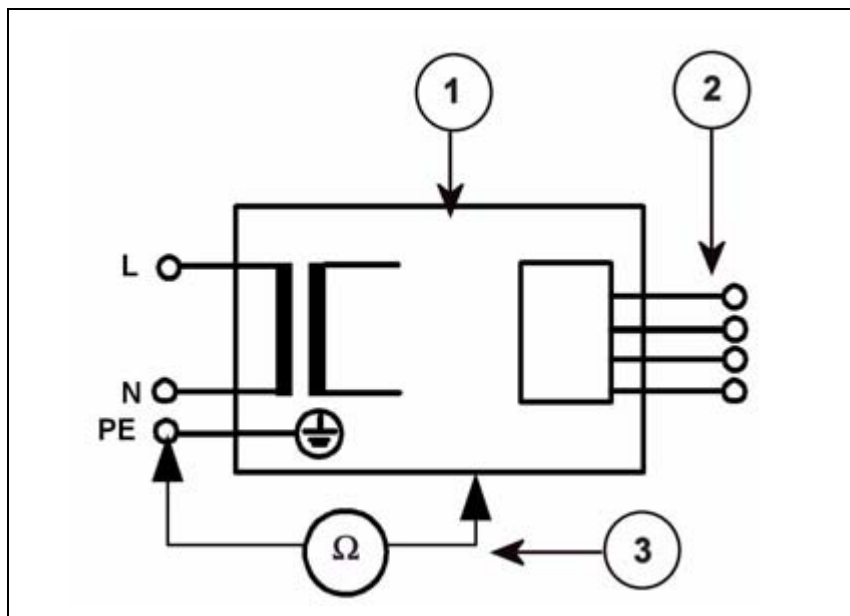


Fig. 1: Measuring circuit for measuring the protective conductor resistance for units that are disconnected from power, in compliance with DIN VDE 0751-1/2001-10, Fig. C2.

- Pos. 1 = System
- Pos. 2 = Application part type B (if available)
- Pos. 3 = Measurement setup (integrated into measuring device)

ARCADIS Varic

Opening the covers

- Open the rear cover panel of the basic unit.
- Disconnect the ground wire from the cover panel.

Installing the new footswitch holder

- Once the rear cover panel has been removed from the basic unit, you can see three holes in it that are fitted with dummy covers.
- Remove the three dummy covers from the cover panel.
- Attach the new multi-function footswitch holder to the cover panel using the screws, lock washers, washers, and nuts included in the accessory kit.

NOTE

The holder for the normal footswitch, mounted on the front of the basic unit, can remain on the basic unit.

If the customer would like this holder to be removed, unscrew it and close the two threaded holes with the cover panel screws included in the accessory kit.

Installing the D31 board



Fig. 2: D31 holder, installation location



Fig. 3: D31 board holder



Fig. 4: Holder, installed

- Unscrew the two Allen screws and screw two spacer bolts into the threaded holes provided. See [\(Fig. 2 / p. 8\)](#)
- Before attaching the mounting plate, attach the 4 circuit board holders with 4 screws and 4 washers. See [\(Fig. 3 / p. 9\)](#) and [\(Fig. 4 / p. 9\)](#)
- Attach the mounting plate to the two spacer bolts with screws, washers, and lock washers. See [\(Fig. 4 / p. 9\)](#)
- Clip the D31 board onto the circuit board holders. Make sure the board clicks in all the way in the circuit board holders. Note the correct positioning of the board here: [\(Fig. 6 / p. 10\)](#).

Wiring

Removing the wire from the RNH.3 and RNH.4 relays to D1.X14

- At the RNH (emergency stop relay), remove the RNH.3 and RNH.4 wires.
- On the D1 board, detach the D1.X14 plug.

- Remove the wire. To do so, cut open the appropriate cable ties.
 ⇒ The wire will be replaced with the Y cable included in the accessory kit.

Wiring the Y cable



Fig. 5: X21 plug location

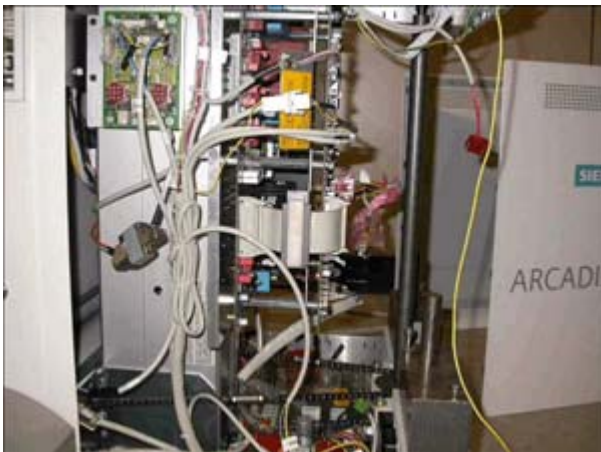


Fig. 6: Y cable, bound

- Wire the Y cable from the accessory kit as follows:
 - ⇒ Plug the Y cable's RNH.3 plug into the RNH.3 relay.
 - ⇒ Plug the Y cable's RNH.4 plug into the RNH.4 relay.
 - ⇒ Plug the Y cable's D1.X14 plug into the D1.X14 board.
 - ⇒ Plug the Y cable's D31.X2 plug into the new D31.X2 board.
 - ⇒ Plug the Y cable's D31.X5 plug into the new D31.X5 board.
 - ⇒ Plug the Y cable's X21 plug into the open X21 socket on the footswitch mounting jack. See (Fig. 5 / p. 10).
- Coil up any excess length of the Y cable. See (Fig. 6 / p. 10). Attach the ends of the Y cable along the existing cable assemblies using the cable ties included in the accessory kit.

- Insert the plug for the multi-function footswitch into the footswitch socket and lock it in place.

Closing the covers

- Reattach the ground wire to the rear cover panel of the basic unit. Make sure the wire has good contact with the cover panel.
- Reattach the rear cover panel to the basic unit.
- Skip the next section, "ARCADIS Orbic."
 - ⇒ Continue with the section "Updating the footswitch symbols".

ARCADIS Orbic

Opening the covers

- Open the rear cover panel of the basic unit.
- Disconnect the ground wire from the cover panel.

Installing the new footswitch holder

- Once the rear cover panel has been removed from the basic unit, you can see three holes in it that are fitted with dummy covers.
- Remove the three dummy covers from the cover panel.
- Attach the new multi-function footswitch holder to the cover panel using the screws, lock washers, washers, and nuts included in the accessory kit.

NOTE

The holder for the normal footswitch, mounted on the front of the basic unit, can remain on the basic unit.

If the customer would like this holder to be removed, unscrew it and close the two threaded holes with the cover panel screws included in the accessory kit.

Installing the D31 board



Fig. 7: D31 board holder



Fig. 8: D31 holder and board, installation location

- Insert the threaded ends of the three spacer bolts from above into the holes in the frame of the basic unit. The spacer bolts are visible in (Fig. 8 / p. 13) underneath the mounting plate..
- Screw down the three spacer bolts from the underside of the basic unit's frame with three nuts, washers, and lock washers.
- Attach the 4 circuit board holders to the mounting plate with 4 screws, 4 washers, and retaining rings. See (Fig. 7 / p. 12).
- Clip the D31 board onto the circuit board holders. Make sure the board clicks in all the way in the circuit board holders.

Wiring for systems without the 3D reconstruction option installed

Removing the wire from the M16.K1.3 and M16.K1.4 relays to D1.X14

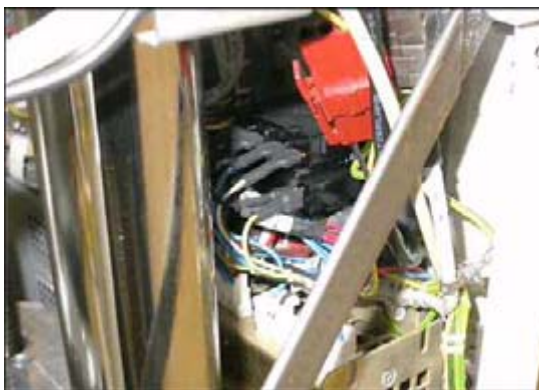


Fig. 9: M16.K1 relay location

- At the M16.K1 relay (emergency stop relay, see (Fig. 9 / p. 13)) remove the M16.K1.3 and M16.K1.4 wires.
- On the D1 board, detach the D1.X14 plug.
- Remove the wire. To do so, cut open the appropriate cable ties.
 - ⇒ The wire will be replaced with the Y cable included in the accessory kit.

Wiring the Y cable



Fig. 10: X21 plug location

- Wire the Y cable from the accessory kit as follows:
 - ⇒ Plug the Y cable's D31.X2 plug into the new D31.X2 board.
 - ⇒ Plug the Y cable's D31.X5 plug into the new D31.X5 board.
 - ⇒ Plug the Y cable's RNH.3 plug into the M16.K1.3 relay.
 - ⇒ Plug the Y cable's RNH.4 plug into the M16.K1.4 relay.
 - ⇒ Plug the Y cable's D1.X14 plug into the D1.X14 board.
 - ⇒ Plug the Y cable's X21 plug into the open X21 socket, connected to the foot-switch mounting jack. See (Fig. 10 / p. 14).
- Attach the ends of the Y cable along the existing cable assemblies using the cable ties included in the accessory kit.
- Insert the plug for the multi-function footswitch into the footswitch socket and lock it in place.

Wiring for systems with the 3D reconstruction option installed

Wiring the Y cable

- Modify the Y cable from the accessory kit as follows:
 - ⇒ Locate the wires labeled RNH.3 and RNH.4. These lead to the Y cable's D1.X14 plug.
 - ⇒ Cut the RNH.3 and RNH.4 wires at a distance of about 8cm from the D1.X14 plug, and insulate them with heat-shrink tubing. The label with the designation D1 X14 should still be in place and should remain so.

NOTE

The RNH.3 and RNH.4 wires are not needed when the 3D reconstruction option is installed.

- Wire the modified Y cable as follows:
 - ⇒ Plug the Y cable's D31.X2 plug into the new D31.X2 board.
 - ⇒ Plug the Y cable's D31.X5 plug into the new D31.X5 board.
 - ⇒ Plug the Y cable's D1.X14 plug into the D1.X14 board.
 - ⇒ Plug the Y cable's X21 plug into the open X21 socket on the footswitch mounting jack.
- Attach the ends of the Y cable along the existing cable assemblies using the cable ties included in the accessory kit.
- Insert the plug for the multi-function footswitch into the footswitch socket and lock it in place.

Closing the covers

- Reattach the ground wire to the rear cover panel of the basic unit. Make sure the wire has good contact with the cover panel.
- Reattach the rear cover panel to the basic unit.

Updating the footswitch symbols

- The accessory kit contains several symbols for the new footswitch. Affix them to the footswitch as follows:
 - Affix "Save Image" symbol (Fig. 11 / p. 16) here: (1/Fig. 15 / p. 18).
 - Affix "Select Mode" symbol (Fig. 12 / p. 17) here: (2/Fig. 15 / p. 18).
 - Affix "Release Radiation Pedal" symbol (Fig. 14 / p. 18) here: (3/Fig. 15 / p. 18).
 - Affix "Fluoro Pedal" symbol (Fig. 13 / p. 17) here: (4/Fig. 15 / p. 18).

NOTE

For the ARCADIS Varic and ARCADIS Orbic, the functions of the two footswitch pedals (up to software version VB13C) cannot be changed. From software version VB13C onward, the foot pedal functions will be alterable via the software.

The following description applies to the configuration with software version VB13C and to the as-delivered state (default programming) with software version VB13C or higher.

With software versions VB13C and higher, if the foot pedal functions are swapped via reprogramming, the symbols to be affixed must correspond to the functions that have been reprogrammed. (Affix "Fluoro Pedal" symbol (Fig. 13 / p. 17) here: (3/Fig. 15 / p. 18); affix "Release Radiation Pedal" symbol (Fig. 14 / p. 18) here: (4/Fig. 15 / p. 18))



Fig. 11: "Save Image" symbol

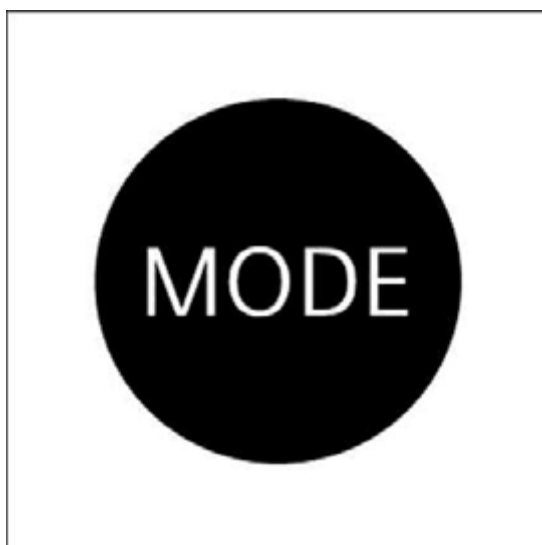


Fig. 12: "Select Mode" symbol

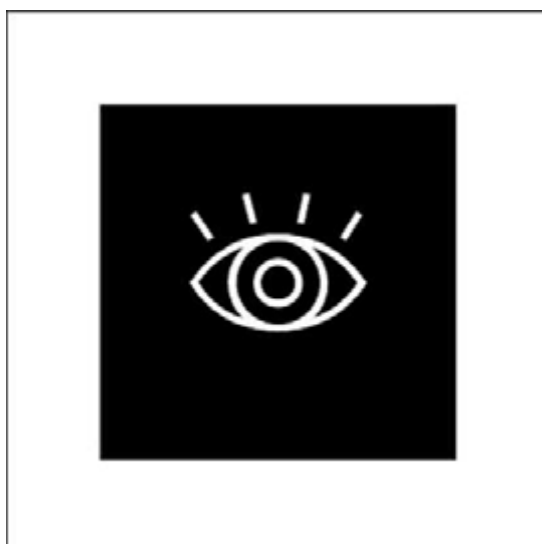


Fig. 13: "Fluoro Pedal" symbol

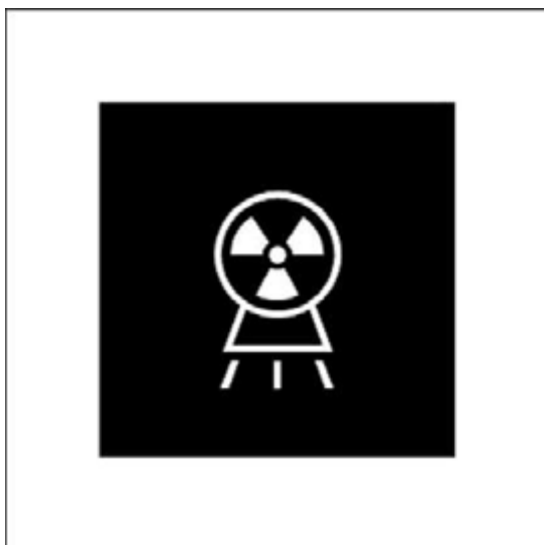


Fig. 14: "Release Radiation Pedal" symbol

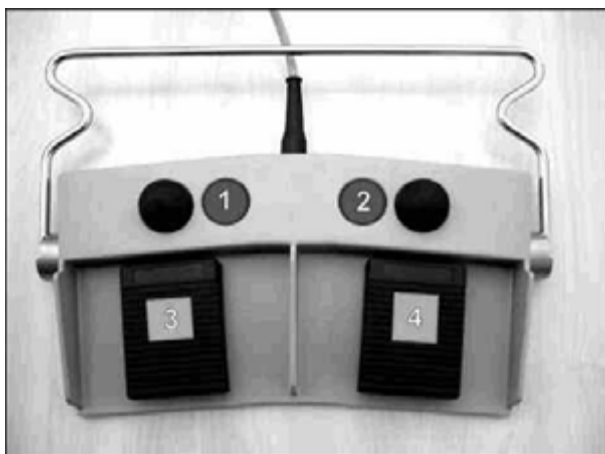


Fig. 15: Multi-function footswitch

Function check



- Plug the monitor cable into the basic unit.
- Switch on the system and wait for it to boot.
- Register an emergency patient.
- Briefly release fluoro with the fluoro pedal.
 - ⇒ Fluoro mode is executed and radiation is released.
- On the multi-function footswitch, press the "Save Image" button.
 - ⇒ The LIH image is saved, and is also displayed on the right-hand monitor.
- On the multi-function footswitch, press the "Select Mode" button several times.
 - ⇒ The PFC, subtraction, roadmap, and DR modes are selected successively, and the LED for the currently selected mode lights up. If the button is pressed again after DR has been selected, the modes are successively selected again in the order: PFC, subtraction, roadmap, DR.

NOTE

The subtraction and roadmap modes can only be selected if the license for subtraction has been installed.



- With the "Select Mode" button, select the PFC mode.
- In the selected mode, briefly press the "Release Radiation" foot pedal.
 - ⇒ The selected mode is executed and radiation is released.



- Select each mode in turn and check the function of each.
- Once again, briefly release fluoro with the fluoro pedal.
 - ⇒ Fluoro mode is executed and radiation is released.
 - ⇒ During the release of radiation, the fluoro button LED on the operating console of the basic unit lights up.
 - ⇒ After the radiation release stops, the previously selected mode is selected again automatically, and the LED on the corresponding button (PFC, SUB, ROAD or DR) lights up.

Final work steps

Covers

- Close all cover panels if any are still open. Make sure the protective conductors make good contact.

Protective conductor resistance test

- Observe the instructions for the protective conductor resistance test in Chapter 1 of these instructions.
- Perform the protective conductor resistance test according to ARTD-002.731.17...
 - ⇒ The protective conductor resistance must not exceed 0.2 ohms.

Customer training

NOTE

The system operating manual already describes the multi-function footswitch and its functions.

- Explain the functions of the multi-function footswitch to the customer. Also, demonstrate how to place the footswitch in the holder.